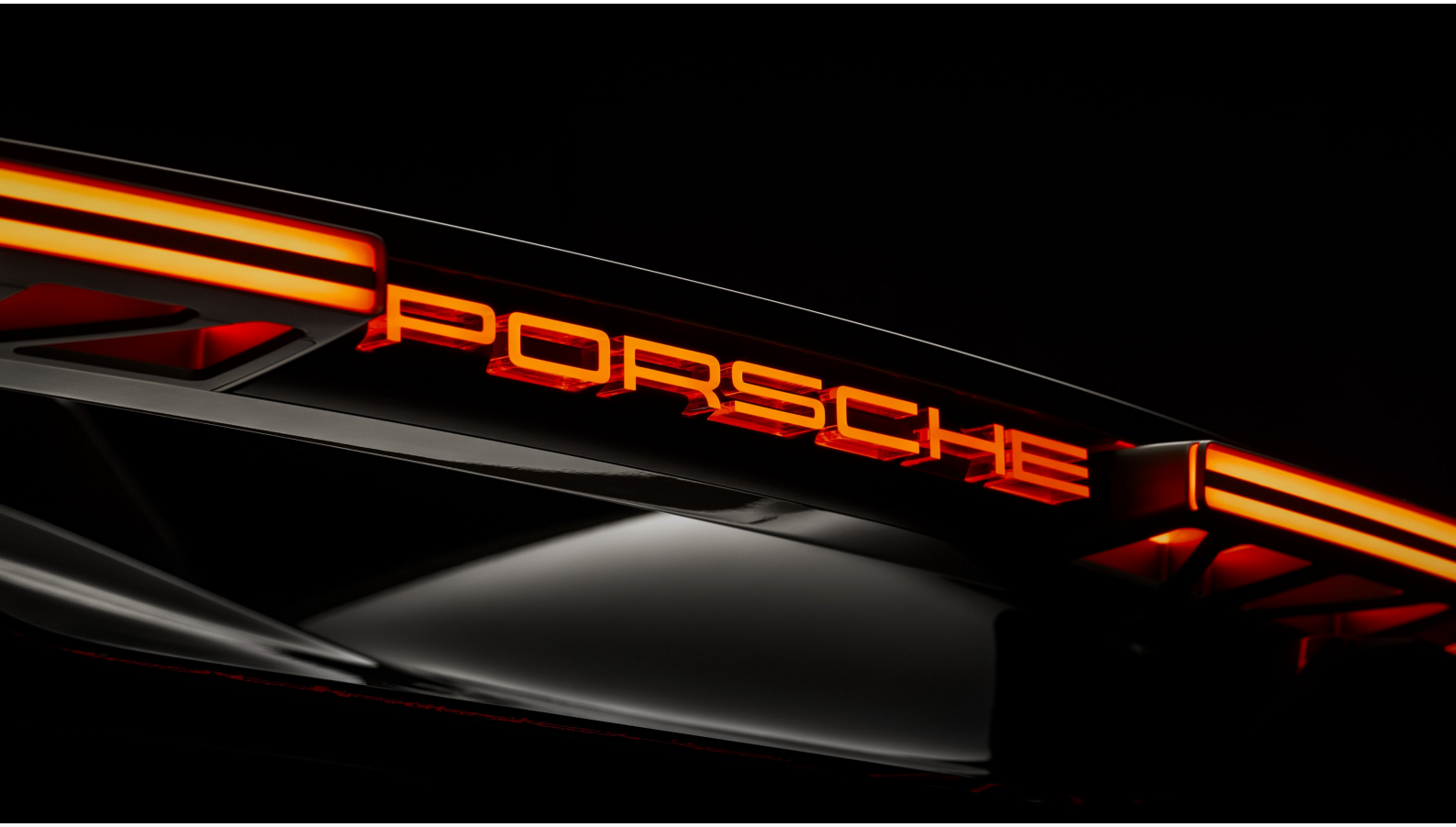


Top marks in power-to-weight ratio, downforce and charging

14/01/2024 Top marks in power-to-weight ratio, downforce and charging

Porsche exemplifies e-performance yet is also a pioneer in sustainable mobility. The concept study fully meets both objectives. Our visions: if the Mission X is to go into series production, then it should

- Be the fastest road-approved vehicle on the Nürburgring Nordschleife.
- Have a power-to-weight ratio of roughly one PS per kilogram.
- Achieve downforce values well above the level of the current 911 GT3 RS.
- Offer a significantly improved charging performance with its 900-volt system architecture, and charge roughly twice as quickly as Porsche's current frontrunner, the Taycan Turbo S.

Extreme lightweight construction and an all-electric drive concept with powerful electric motors are the basis for the outstanding power-to-weight ratio. By way of comparison, the Porsche 918 Spyder has a

power-to-weight ratio of 0.5 PS per kg.

Lightweight design throughout

Lightweight design is part of the Porsche DNA. A light car is not only more efficient but is in particular more agile in corners – decisive characteristics for a hypercar aiming for exceptional performance and lap times. As a supporting element, the high voltage battery is integrated into the rear of the car to perform this function.

This innovative design principle for high voltage batteries in electric vehicles is part of the lightweight construction concept of the Mission X concept study. Individual systems are combined to form functionally integrated structures that perform both thermal and mechanical tasks. Cooling systems, for example, are integrated directly into the support structures of the body, which both saves weight and further optimises cooling.

Lightweight construction is also immediately apparent in the form of large-scale carbon-weave sections and the support structures of the frames for the lights. With the 900-volt system architecture, the compact, weight-optimised powertrain, the exoskeleton made of carbon-fibre reinforced plastic (CFRP) and many other measures, the Mission X concept study underscores its claim as a simultaneously high-performance and lightweight Porsche hypercar.

High continuous power output and substantially improved charging performance

The electric motors are the next generation of powerful, permanently excited synchronous motors (PSM) – much like in the Mission R concept study. The direct cooling of the stator feeds the oil directly along the copper windings. This allows the heat from the motors to be dissipated directly at source and their effectiveness to be increased.

This is how the very high peak performance, its consistency and the exceptionally high efficiency associated with motorsport are achieved. Thanks to the enormous performance potential of the electric motors, during acceleration power is transferred to the wheels without any losses via a compact, weight-optimised single-speed transmission. The drive-energy is delivered by a high-performance battery with state-of-the-art technology coupled with a 900-volt system architecture. The very high voltage enables performance advantages without necessitating weight compromises and additional heat losses.

Likewise, the directly oil-cooled battery with high-end cells offers an optimum combination of efficiency, weight and power. The cell chemistry is designed for maximum performance. The position of the battery, installed centrally behind the seats in the vehicle in an e-core layout, enables a low, driver-

optimised seating position. In comparison to a conventional underfloor battery, the e-core layout helps centre the weight in the car. As with a conventionally powered mid-engined car, this results in excellent agility.

Comprehensive aerodynamic concept with Porsche Active Aerodynamics (PAA)

The e-core layout of the Mission X concept study enables a very low-slung, dynamic flyline. The exoskeleton made of carbon-fibre-reinforced plastic (CFRP) with a lightweight glass dome has a very slim design. Conventional rear-view mirrors have been dispensed with and the wheels are aerodynamically optimised.

And, because the airflow around the car is routed through the body, the Cd value of the concept study has been reduced to the maximum for optimised energy efficiency on the track. This in turn has enabled the battery to be optimised, weight reduced, and performance increased.

However, aerodynamics are more than simply efficiency due to low wind resistance. To achieve outstanding driving dynamics on the track, high downforce is also required. The Mission X concept study achieves the necessary downforce by means of Porsche Active Aerodynamics (PAA), which includes a Drag Reduction System (DRS) and aerodynamic elements in the lower area of the car and in the underbody.

The adaptive aerodynamic elements are intelligently controlled based on numerous parameters such as driving mode, lateral acceleration (cornering forces) and speed. This affects both drag and downforce. As a result, the Mission X concept study can be set up for maximum efficiency as well as the best possible performance on the track.

Damper technology from the world of motorsport

For aerodynamic purposes, the concept car has mixed-size tyres, with 20-inch wheels at the front and 21-inch wheels at the rear. At the same time, the tyres on the driven rear axle (315/20 R 21) are six centimetres wider than on the front axle (255/35 R 20).

The damper technology and the suspension are derived from the motorsport arena. As with the current 911 GT3 RS, the driver is supported by many chassis systems, which they can directly access and operate via four individual mode switches on the steering wheel. This allows for quick access. The rebound and compression stages of the dampers can be adjusted individually for the driver and the conditions via the PASM mode switch.

PTV Plus enables the optimisation of steering behaviour and precision during highly dynamic driving.

The driving modes and the Electronic Stability Control (ESC) and Traction Control (TC) systems are adjusted via two further mode switches. The chassis of the Mission X is at once designed both for extraordinary lap times and precise adaptation to the wishes of the driver.

MEDIA ENQUIRIES



Mayk Wienkötter

Spokesperson Panamera and Taycan
+49 (0) 170 / 911 8684
mayk.wienkoetter@porsche.de

Link Collection

Link to this article
https://newsroom.porsche.com/en/press-kits/Porsche-Mission-X/The-technology.html

Media Package
https://pmdb.porsche.de/newsroomzips/0a1d7d7e-4985-43e9-997f-0c24e08500f6.zip